

REMARKS

Claims 1-4, 6-11, 13, 14 and 16-21 are pending in the present application. Claims 1, 10, 13, 14, 16, 19 and 21 have been amended. Claim 22 has been presented herewith.

Claim Rejections-35 U.S.C. 103

Claims 1-3, 6-11, 13-18, 21 and 22 have been rejected under 35 U.S.C. 103(a) as being unpatentable over the Ochiai reference (U.S. Patent No. 6,043,526) in view of the Basceri et al. reference (U.S. Patent No. 6,444,478). This rejection, insofar as it may pertain to the presently pending claims, is traversed for the following reasons.

The ferroelectric capacitor of claim 1 includes in combination a bottom electrode; a dielectric layer; a ferroelectric layer; and a top electrode, "wherein a side end surface of the first region of the bottom electrode, a side end surface of the dielectric layer, a side end surface of the ferroelectric layer and a side end surface of the top electrode are aligned, and wherein a distance between the bottom electrode and the top electrode at the side end surfaces is greater than a distance between the bottom electrode and top electrode at the second region". Applicant respectfully submits that the prior art as relied upon by the Examiner does not disclose or make obvious these features.

Enclosed is a copy of Fig. 3 of the Ochiai reference as relied upon by the Examiner, wherein Applicant has indicated the first and second regions of the bottom

electrode in accordance with an understanding of the outstanding rejection as particularly set forth at the bottom of page 2 of the current Office Action dated December 15, 2005. It is Applicant's understanding that the Examiner has interpreted a central portion of the bottom electrode including projection 21 and layer 23 thereon in Fig. 3 of the Ochiai reference as the second region of the bottom electrode, as featured in claim 1. It is Applicant's further understanding that the Examiner has interpreted a region of the bottom electrode which is peripheral to projection 21 and which includes generally only layer 23 in Fig. 3 as the first region of the bottom electrode of claim 1.

The Examiner is respectfully requested to confirm on the record that Applicant's above noted understanding as indicated in enclosed Fig. 3 of the Ochiai reference is correct.

As emphasized beginning on page 12 of the Amendment dated October 17, 2005, upper electrode 26 in Fig. 3 of the Ochiai reference is shown as conformally formed over layer 23, and thus projection 21. Also, capacitor insulation film 25 in Fig. 23 of the Ochiai reference is formed conformally over layer 23. Since upper electrode 26 in particular is conformal, it would thus appear self evident that the distance between layer 23 (which has been interpreted as part of the first and second regions of the bottom electrode by the Examiner) and upper electrode 26 in Fig. 3 of the Ochiai reference is constant or the same throughout the extent of the capacitor illustrated. The manipulation or partitioning of Fig. 3 of the Ochiai reference as understood in view of the current rejection as noted above does not overcome the fact that upper electrode

26 is conformal.

Beginning on page 11 of the Response to Arguments section of the current Office Action dated December 15, 2005, the Examiner has asserted that “the distance between the bottom electrode 23 on the left hand side to the top of the top electrode, where the distance is measured from the top surface of 23 to the top surface of 26 is greater than the distance from the top surface of 24 to the top surface of 26” (our emphasis added).

Applicant however respectfully submits that in view of the above noted comments as offered in the current Office Action, it would appear that the Examiner has misconstrued the features of claim 1. Claim 1 pending as of December 15, 2005, featured a distance “between the bottom electrode and the top electrode”, not a distance between the bottom electrode “to the top of the top electrode”, as asserted by the Examiner.

Although it is Applicant’s position that the Examiner has misinterpreted the features of claim 1 for example, and thus has misapplied the Ochiai reference, claim 1 has been amended to feature “wherein a distance between the bottom electrode and the top electrode at the side end surfaces is greater than a distance between the bottom electrode and the top electrode at the second region”.

Clearly, the distance between layer 23 and upper electrode 26 at the left most portion or side end surfaces of the capacitor in Fig. 3 of the Ochiai reference, is the same as the distance between layer 23 and upper electrode 26 at projection 21 in the

second region as characterized by the Examiner. That is, Fig. 3 of the Ochiai reference as relied upon by the Examiner does not include a distance between a bottom electrode and a top electrode at side end surfaces thereof, that is greater than a distance between the bottom electrode and the top electrode at a second region, as would be necessary to meet the features of claim 1. The Basceri et al. reference as secondarily relied upon does not overcome these deficiencies. Applicant therefore respectfully submits that the ferroelectric capacitor of claim 1 would not have been obvious in view of the prior art as relied upon by the Examiner taken singularly or together, and that this rejection, insofar as it may pertain to claims 1-3 and 6-9, is improper for at least these reasons.

The ferroelectric capacitor of claim 10 features in combination that "a distance between the bottom electrode and the top electrode at a side end surface of the step area is greater than a distance between the bottom electrode and the top electrode at a central area of the ferroelectric capacitor".

Applicant respectfully submits that for at least somewhat similar reasons as set forth above, the prior art as relied upon by the Examiner does not disclose or make obvious the above noted features of claim 10. Applicant therefore respectfully submits that the ferroelectric capacitor of claim 10 would not have been obvious in view of the prior art as relied upon by the Examiner taken singularly or together, and that this rejection, insofar as it may pertain to claims 10, 11 and 13, is improper for at least these reasons.

The ferroelectric capacitor of claim 14 features in combination "wherein a distance between the plate portion of the first electrode and the second electrode at the side end surfaces is greater than a distance between the projecting portion of the first electrode and the second electrode". Applicant respectfully submits that for somewhat similar reasons as set forth above, the prior art as relied upon by the Examiner does not disclose or make obvious the above noted features of claim 14. Accordingly, Applicant respectfully submits that the ferroelectric capacitor of claim 14 would not have been obvious in view of the prior art as relied upon by the Examiner taken singularly or together, and that this rejection, insofar as it may pertain to claim 14, is improper for at least these reasons.

The semiconductor device of claim 16 features in combination "wherein a distance between the bottom electrode and the top electrode at the side end surfaces is greater than a distance between the bottom electrode and the top electrode at the second region". Applicant respectfully submits that for somewhat similar reasons as set forth above, the prior art as relied upon by the Examiner does not disclose or make obvious the above noted features of claim 16. Applicant therefore respectfully submits that the semiconductor device of claim 16 would not have been obvious in view of the prior art as relied upon by the Examiner taken singularly or together, and that this rejection, insofar as it may pertain to claims 16-18, is improper for at least these reasons.

The ferroelectric capacitor of claim 21 features in combination "wherein a

distance between the bottom electrode and the top electrode at the side end surfaces is greater than a distance between the bottom electrode and the top electrode at the central area". Applicant respectfully submits for somewhat similar reasons as set forth above, that the prior art as relied upon by the Examiner does not disclose or make obvious the above noted features of claim 21. Applicant therefore respectfully submits that the ferroelectric capacitor of claim 21 would not have been obvious in view of the prior art as relied upon by the Examiner taken singularly or together, and that this rejection, insofar as it may pertain to claim 21, is improper for at least these reasons.

Claims 19 and 20 have been rejected under 35 U.S.C. 103(a) as being unpatentable over the Ochiai and the Basceri et al. references, in further view of the Kobayashi reference (U.S. Patent No. 6,495,879). This rejection, insofar as it may pertain to the presently pending claims, is traversed for the following reasons.

The semiconductor device of claim 19 features in combination "wherein a distance between the bottom electrode and the top electrode at the side end surfaces is greater than a distance between the bottom electrode and the top electrode at the second region".

As emphasized previously, the primarily relied upon prior art references do not disclose or make obvious the above noted features of claim 19. The Kobayashi reference as secondarily relied upon does not overcome the above noted deficiencies of the primarily relied upon prior art. Applicant therefore respectfully submits that the semiconductor device of claim 19 would not have been obvious in view of the prior art as

relied upon by the Examiner taken singularly or together, and that this rejection, insofar as it may pertain to claims 19 and 20, is improper for at least these reasons.

Allowable Subject Matter

Applicant respectfully notes the Examiner's acknowledgment that claim 4 has objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form. However, Applicant respectfully submits that claim 4 should be allowable at least by virtue of dependency upon claim 1 for the reasons as set forth above, and that amendment of claim 4 to be in independent form is thus unnecessary.

Conclusion

The Examiner is respectfully requested to reconsider and withdraw the corresponding rejections, and to pass the claims of the present application to issue, for at least the above reasons.

Pursuant to the provisions of 37 C.F.R. 1.17 and 1.136(a), the Applicant hereby petitions for an extension of three (3) months to June 15, 2006, for the period in which to file a response to the outstanding Office Action. The required fee of \$1020.00 should be charged to Deposit Account No. 50-0238.

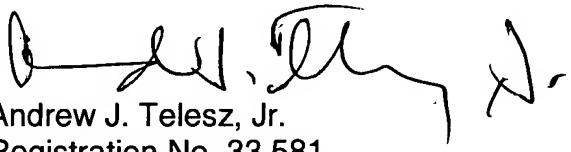
In the event that there are any outstanding matters remaining in the present application, please contact Andrew J. Telesz, Jr. (Reg. No. 33,581) at (571) 283-0720

in the Washington, D.C. area, to discuss these matters.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment for any additional fees that may be required, or credit any overpayment, to Deposit Account No. 50-0238.

Respectfully submitted,

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Enclosures: Marked-Up Fig. 3 of the Ochiai reference